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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/629,785	07/31/2000	Duncan J. Forbes	476-1934	4864

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EXAMINER	
PHAN, HANH	

ART UNIT	PAPER NUMBER
2633	2

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/629,785	FORBES ET AL.	
	Examiner	Art Unit	
	Hanh Phan	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

-In the abstract, the form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. For example, "output port of a **said** splitter or coupler from each **said** optical network."

Claim Objections

3. Claim 7 is objected to because of the following informalities: in claim 7, the phrase " an output port of one **splitters/coupler** is coupled to an input port of another splitter/coupler " should be changed to -- an output port of one splitter/coupler is coupled to an input port of another splitter/coupler --. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakata et al (US Patent No. 6,414,768).

Regarding claim 1, referring to Figures 1 and 4, Sakata discloses a communications network for connecting a number of nodes (i.e., terminals of a subscriber line 1 such as subscriber devices ONU#1 to ONU#n) with a headend (i.e., office device OLT 2), the network comprising:

two optical networks each comprising a plurality of splitters or couplers serially connected by optical waveguides such that an output port of one splitter/coupler is

coupled to an input port of another splitter/coupler (as indicated in Fig. 1, a first optical service unit OSU 3a as an optical transmitting/receiving device provided in an office device 2 and a second optical service unit OSU 3b as an optical transmitting/receiving device provided in an office device 2. The OSU 3a uses the terminals of subscriber line 1 such as ONU#1-ONU#n from one side as an act system, and the OSU 3b uses the terminals of subscriber line 1 above from the other side as a standby system, and along the looped subscriber line 1, a plurality of optical star couplers 7 are located as optical branching/coupling elements serially connected by optical transmission line 1 such that an output port of one star coupler 7 is coupled to an input port of another star coupler 7, see col. 3, lines 55-67 and col. 4, lines 1-4 and lines 13-32), and

wherein an input or output for each said node is formed by a non-serially connected input or output port of a said splitter or coupler from each said optical network (as indicated in Figs. 1 and 4, along the looped subscriber line 1, a plurality of optical star coupler 7 are located as an optical branching/coupling element. Each of subscriber devices ONU#1-ONU#n is connected to the corresponding optical star coupler 7. The subscriber devices ONU#1 to ONU#n are connected to the looped subscriber line 1 via an optical directional coupler 10, and each of subscriber devices ONU#1-ONU#n includes a node circuit 13 that is connected to the directional coupler 10 via an optic-electric converter 11 and an electric-optic converter 12, see col. 4, lines 12-32).

Regarding claim 2, Sakata further teaches each optical network comprises a plurality of serially connected splitters for outgoing traffic and a complementary plurality

of serially connected couplers for incoming traffic (i.e., a first optical service unit OSU 3a as an optical transmitting/receiving device operated as act system with the terminals of subscriber line such as ONU#1-ONU#n comprises a plurality of serially connected branching elements of star coupler 7 for outgoing traffic and a complementary plurality of serially connected coupling elements of star coupler 7 for incoming traffic, see col. 4, lines 12-32).

Regarding claim 3, Sakata also teaches that the optical networks are fiber networks (i.e., a first optical service unit OSU 3a as an optical transmitting/receiving device operated as act system with the terminals of subscriber line 1, a second optical service unit OSU 3b as an optical transmitting/receiving device operated as standby system with the terminals of subscriber line 1, and along the looped subscriber line 1, a plurality of optical star couplers 7 are located as optical branching/coupling elements serially connected by optical transmission line 1 such that an output port of one star coupler 7 is coupled to an input port of another star coupler 7, see Fig. 1, col. 3, lines 55-67).

Regarding claim 6, Sakata further teaches that two of the serially connected splitters or couplers are co-located (as indicated in Fig. 4, branching element and coupling element of star coupler 7 are co-located, see col. 5, lines 12-22).

Regarding claim 7, referring to Figures 1 and 4, Sakata discloses a communications network for connecting a number of nodes (i.e., terminals of a subscriber line 1, for example, subscriber devices Optical Node Unit ONU#1 to ONU#n) with a headend (i.e., office device OLT 2), the network comprising:

two fiber networks each comprising a plurality of splitters or couplers serially connected by optical fiber such that an output port of one splitter/coupler is coupled to an input port of another splitter/coupler (as indicated in Fig. 1, a first optical service unit OSU 3a as an optical transmitting/receiving device provided in an office device 2 and a second optical service unit OSU 3b as an optical transmitting/receiving device provided in an office device 2. The OSU 3a uses the terminals of subscriber line 1 such as ONU#1-ONU#n from one side as an act system, and the OSU 3b uses the terminals of subscriber line 1 above from the other side as a standby system, and along the looped subscriber line 1, a plurality of optical star couplers 7 are located as optical branching/coupling elements serially connected by optical transmission line 1 such that an output port of one star coupler 7 is coupled to an input port of another star coupler 7, see col. 3, lines 55-67 and col. 4, lines 1-4 and lines 13-32), and

wherein an input or output for each said node is formed by a non-serially connected input or output port of a said splitter or coupler (as indicated in Figs. 1 and 4, along the looped subscriber line 1, a plurality of optical star coupler 7 are located as an optical branching/coupling element. Each of subscriber devices ONU#1-ONU#n is connected to the corresponding optical star coupler 7. The subscriber devices ONU#1 to ONU#n are connected to the looped subscriber line 1 via an optical directional coupler 10, and each of subscriber devices ONU#1-ONU#n includes a node circuit 13 that is connected to the directional coupler 10 via an optic-electric converter 11 and an electric-optic converter 12, see col. 4, lines 12-32);

wherein the two optical networks together form a ring architecture (i.e., act system OSU 3a and standby system OSU 3b with subscribers ONU#1-ONU#n and star couplers 7 together form a ring architecture, see Fig. 1, col. 3, lines 55-67).

Regarding claim 8, referring to Figures 1 and 4, Sakata discloses a method of operating a communications network for connecting a number of nodes (i.e., terminals of a subscriber line 1, for example, subscriber devices Optical Node Unit ONU#1 to ONU#n) with a headend (i.e., office device OLT 2), the network comprising:

two optical networks each comprising a plurality of splitters or couplers serially connected by optical waveguides such that an output port of one splitter/coupler is coupled to an input port of another splitter/coupler (as indicated in Fig. 1, a first optical service unit OSU 3a as an optical transmitting/receiving device provided in an office device 2 and a second optical service unit OSU 3b as an optical transmitting/receiving device provided in an office device 2. The OSU 3a uses the terminals of subscriber line 1 such as ONU#1-ONU#n from one side as an act system, and the OSU 3b uses the terminals of subscriber line 1 above from the other side as a standby system, and along the looped subscriber line 1, a plurality of optical star couplers 7 are located as optical branching/coupling elements serially connected by optical transmission line 1 such that an output port of one star coupler 7 is coupled to an input port of another star coupler 7, see col. 3, lines 55-67 and col. 4, lines 1-4 and lines 13-32), and

wherein an input or output for each said node is formed by a non-serially connected input or output port of a said splitter or coupler from each said optical network (as indicated in Figs. 1 and 4, along the looped subscriber line 1, a plurality of

optical star coupler 7 are located as an optical branching/coupling element. Each of subscriber devices ONU#1-ONU#n is connected to the corresponding optical star coupler 7. The subscriber devices ONU#1 to ONU#n are connected to the looped subscriber line 1 via an optical directional coupler 10, and each of subscriber devices ONU#1-ONU#n includes a node circuit 13 that is connected to the directional coupler 10 via an optic-electric converter 11 and an electric-optic converter 12, see col. 4, lines 12-32);

wherein the method comprising routing traffic between the headend (i.e., office device OLT 2) and said nodes (i.e., the terminals of the suscriber line 1, for example, subscriber devices ONU#1 to ONU#n)(see col. 3, lines 55-67 and col. 4, lines 12-32).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being obvious over Sakata et al (US Patent No. 6,414,768) in view of Huang et al (US Patent No. 6,160,932).

Regarding claims 4 and 5, Sakata discloses all the aspects of the claimed invention as set forth in the rejection to claim 1 above, except fails to teach "the splitters

and couplers are periodic interleaving filters"(claim 4) and "the filters are fused fiber couplers"(claim 5).

However, Huang, in US 6,160,932, teaches splitters and couplers are periodic interleaving filters which are fused fiber couplers (as indicated in Fig. 10A that shows an example of a 4x1 (or 1x4) wavelength division multiplexer (WDM) including three Mach-Zehnder Interferometer MZIs are cascaded to form two stages, which couple signals at four wavelengths onto a single line. Signals at wavelengths $\lambda 1$ and $\lambda 3$ entering terminals 1010 and 1020, respectively, of an MZI 1030 in the first stage are coupled and transmitted to exit terminal 1040 of MZI 1030 with a wavelength separation or channel spacing of 2 $\Delta\lambda$. Similarly, signals at wavelengths $\lambda 2$ and $\lambda 4$ entering terminals 1050 and 1060, respectively, of MZI 1070 in the first stage are coupled and transmitted to exit terminal 1080 of MZI 1070 with a channel separation 2 $\Delta\lambda$. The output signals within the usable bandwidth from terminals 1040 and 1080, respectively, then enter terminals 1040-1 and 1080-1 of a MZI 1090 in the second stage. The four signals are coupled by MZI 1090, with a output spectrum and exit at terminal 1095. The device of Fig. 10A can be reversed to form a demultiplexer, such that the signal enters terminal 1095 of MZI 1090 and is decoupled into four separate signals exiting at terminals 1010, 1020, 1030, and 1040 with a spacing of 2 $\Delta\lambda$, see col. 6, lines 41-67, col. 7, lines 1-14, col. 5, lines 32-48, and col. 8, lines 37-57 and also see Fig. 12).

One skilled in the art would have recognized that providing the splitters and couplers are periodic interleaving filters which are fused fiber couplers have advantage of allowing selecting the wanted signals and eliminating the unwanted signals, reducing

the signal noise, increasing the signal to noise ratio, reducing the loss of signals when the signals are routed around the network, and reducing the cost of the system. Therefore, it would have been obvious to one having skill in the art at the time the invention was made to use the splitters and couplers of Huang to modify the splitters and couplers of Sakata. One of ordinary skill in the art would have been motivated to do this since the splitters and couplers of Huang have advantage of allowing selecting the wanted signals and eliminating the unwanted signals, reducing the signal noise, increasing the signal to noise ratio, reducing the loss of the signals when the signals routed around the network, and reducing cost of the whole system.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Touma et al (US Patent No 6,288,809) teaches optical subscriber network system.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (703)306-5840.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

Hanh Phan

05/14/2003